**Estimation of the baseline level of aneuploidy in germ and reproductive health in domestic animals**

# Estimation of the baseline level of aneuploidy in germ cells and reproductive health in domestic animals

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The reproductive health of a given species is strictly related to the karyological integrity of the breeding animals (i.e., absence of chromosomal abnormalities) and to the precision with which the haploid chromosomes are segregated into the male (sperm) and female (oocyte) germ cells prior to fertilization. This assumption is supported by the fact that in mammals more than 70% of the embryonic mortality is attributed to aneuploidies in the germ cells which give rise to genetically unbalanced embryos (monosomic or trisomic) destined to abortion, thus reducing fertility and the reproductive/productive efficiency of the animal production industry.
Estimation of the 'baseline' level of aneuploidy in sperm and in in vitro matured oocytes with the corresponding first polar body in domestic animal species and breeds/genetic types is now possible by using the fluorescent in situ hybridization (FISH) technique and chromosome specific painting probes obtained via microdissection and DOP-PCR. Such a 'baseline' level could be used as 'control reference' not only for improving the in vitro production of embryos destined to the animal production industry but also, and more importantly, for monitoring future trends of the reproductive health of the domestic species/breeds engaged in zootechnical productions, especially in relation to the increasing risk of environmental challenges and hazards, such as chemical contaminants in the water, soil, air, micotoxins in the feedstuff, hormone unbalancements, nutritional and dietetical mistakes, and other factors which are known to damage the mitotic and meiotic machinery of the cells.